Trio E-Series

Licensed Ethernet and Serial Base Station Radios

EB45e | EB450

Schneider Electric

Trio E-Series advanced digital data radios provide both Ethernet and serial communications for the most complex and demanding applications in Point-to-Point and Point-to-Multipoint (Multiple Address Radio) Telemetry and remote SCADA systems.

Base/Repeater stations are key elements in radio communication systems and are subject to high duty-cycle operational stresses. Trio EB45e, with Ethernet+serial interfaces, and EB450 with serial-only interfaces, are full duplex digital radio Base/Repeater stations specially designed to complement Trio ER45e and ER450 remote digital data radios by reliably delivering continuous duty operation at maximum rated output power in ambient temperatures up to +60°C (140°F).

The EB450 may be user-configured for operation in either E-Series or M-Series modes. Where 1+1 redundancy protection is required, the Trio EH45e and EH450 hot standby Base/Repeater stations are available.

Product Data Sheet Trio EB450 & EB45e
Specifications

>	Trio EB45e
Radio	
Frequency Range	380-520MHz (various sub-frequency bands available)
Frequency Splits	Various Tx/Rx frequency splits - configurable
Channel Selection	Dual synthesizer, 6.25kHz channel step
Channel Spacing	12.5 or 25kHz
Frequency Accuracy	±1ppm, -30 to +60°C (-22 to 140°F) ambient
Aging	<= 1ppm/annum
Radio Modes	Full and Half duplex, Simplex (Simplex requires separate TX/RX antennas)
Duplexer	Optional external duplexer available for single antenna operation
Configuration	All configuration via Windows based software
Transmitter	
Tx Power	• 5W Model : 1W to 5W (+30 to +37dBm) +/- 1dB configurable with over-temperature and high VSWR protection • 20W Model : 5W to 20W (+37 to +43dBm) +/- 1dB configurable with over-temperature and high VSWR protection
Modulation	Configurable narrow band digitally filtered binary GMSK or 4 level FSK
Tx Keyup Time	< 2mS
Timeout Timer	Configurable 0 to 255 seconds
Tx Spurious	<= -37dBm
PTT Control	Auto (Data) / RTS line (Data Port) / System Port Override / Permanent Tx
Receiver	
Sensitivity	-118dBm for 12dB SINAD
Selectivity	Better than 60dB
Intermodulation	Better than 70dB
Spurious Response	Better than 70dB
AFC Tracking	Digital receiver frequency tracking
Mute	Programmable digital mute
Connections	
Serial Data Port	RS232 DB9 female DCE. 300-38,400bps asynchronous
Serial Data Port Flow Control	Configurable hardware / software / 3-wire interface
Serial Data Port DCD Control	Configurable DCD operation : activated on RF carrier or from user data output
System Port	2 x RS232 RJ45 (Front & Rear): 19,200bps, for configuration and diagnostics
Ethernet Port	1 x RJ45: 10/100 Mbps (auto-MDIX sensing) compliant with IEEE 802.3
Digital I/O	2 Inputs monitored by TView+ Diagnostics Software, 2 outputs user-configurable by TView+ Diagnostics Software
Antenna	2 x N female bulkhead (separate Tx and Rx ports)
Power	2-pin locking, mating connector supplied
LED Display	Multimode Indicators for Pwr, Tx, Rx, Sync, TxD and RxD data LEDs (for both Ethernet and Serial ports) Bargraphs Indicators for Supply Volts, Tx Power, Drive Power, Receive Signal Strength and Frequency Error
Ethernet	
Ethernet Protocols	Ethernet/IP (including UDP, TCP, DHCP, ARP, ICMP, STP, IGMP, SNTP & TFPT)
Ethernet Repeating	Automatic and Self Learning Peer to Peer repeating
Ethernet Traffic Filtering	Configurable: No Filtering / Unicast Traffic & ARP Only / Unicast Traffic Only
Ethernet Link Monitoring	Monitor the Ethernet link between a base unit and up to two remote IP addresses
Compression	Automatic Ethernet data compression
Terminal Server	Legacy RS-232 serial support via embedded terminal server (UDP/TCP)
DHCP Modes	Auto and Manual
SNMP	SNMP V1/V2c, RFC1213-compliant and Trio Ethernet E-Series radio diagnostics parameters (including alarm generation via traps)
Modbus Gateway	Configurable Modbus TCP/IP to Modbus Serial Gateway

Specifications continue on the next page

Product Data Sheet Trio EB450 & EB45e
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>	Trio EB45e
Modem	
RF Channel Data Rate#	• Radio Model F01 : FCC (IC) 9600bps (12.5kHz) & 19200bps (12.5kHz) North America • Radio Model F02 : 19200bps (25kHz) • Radio Model E01 : ETSI 4800bps (12.5kHz) & 9600bps (12.5kHz) Europe • Radio Model A01 : ACMA 4800bps (12.5kHz) / 9600bps (12.5kHz) Australia • Radio Model A02 : ACMA 19200bps (25kHz) Australia
Typical Bit Error Rate#	< $1x10^{-6}$ @ -111dBm (4800bps), < $1x10^{-6}$ @ -110dBm (9600bps), < $1x10^{-6}$ @ -106dBm (19,200bps)
Operating Modes	Base, remote, repeater or store n' forward
Channelshare™	Trio's unique supervisory collision avoidance system
Multistream™	Simultaneous data stream delivery allows for multiple vendor devices/protocols to be transported on the one radio network
Data Turnaround Time	<10mS
Firmware	Local and over-the-air flash-based firmware upgradeable patches with support for broadcast updates
Security	
Encryption*	128-bit AES
Password Protection	Password protected configuration sessions
Diagnostics	

Diagnostics Overview	• TView+ configuration, network management and diagnostic Windows GUI software
	• Network-wide operation from any remote terminal
	• Non intrusive protocol – runs simultaneously with the application
	• SNMP access to radio diagnostics
	• Serial & Ethernet (eDiags) connectivity for diagnostics and configuration
	• Over-the-air re-configuration of user parameters.
	• Storage of data error and channel occupancy statistics
	• In-built Error Rate testing capabilities
	• Diagnostics parameters available
	  • Transmitter Power
	  • Received Signal Strength
	  • DC Supply Voltage
	  • Received Frequency Error
	  • Radio Temperature
	  • VSWR

General	
Operating Temperature Range	-30°C to +60°C (-22°F to +140°F)
Power Supply	13.8Vdc nominal (11-16Vdc)
Transmit Current	• 5W Version: 1.3A nominal @ 1W, 2.5A nominal @ 5W • 20W Version: 2.7A nominal @ 5W, 4.7A nominal @ 20W
Receive Current	< 350mA nominal @ 13.8Vdc
Dimensions	• 5W: 19" 2 RU rack mount, 483 x 90 x 414 mm including heat-sink (19 x 3.5 x 16.3in.) • 20W: 19" 2 RU rack mount, 483 x 90 x 446 mm including heat-sink (19 x 3.5 x 17.6in.)
Weight	5.25kg (11.6lbs) excluding optional duplexer
Approvals and Certifications	
Europe (ETSI)	ETSI EN300113, EN301489, EN60950
FCC	FCC PART 15, PART 90
Industry Canada	IC RS119, ICES-001
Australia	ACMA AS4295-1995 (Data)

* Export restrictions may apply. Contact your local representative for more details.
# Local radio regulatory requirements may dictate the actual RF channel data rate and Bit Error Rates available. Contact your local representative for more details

Note: Not all product features are available in every mode of operation.

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Product Data Sheet Trio EB450 & EB45e
Specifications

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Frequency Range	380-520MHz (various sub-frequency bands available)
Frequency Splits	Various Tx/Rx frequency splits - configurable
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Channel Spacing	12.5 or 25kHz
Frequency Accuracy	±1ppm, -30 to +60°C (-22 to 140°F) ambient
Aging	<= 1ppm/annum
Radio Modes	Full and Half duplex, Simplex (Simplex requires separate TX/RX antennas)
Duplexer	Optional external duplexer available for single antenna operation
Configuration	All configuration via Windows based software
Transmitter	
Tx Power	• 5W Model : 1W to 5W (+30 to +37dBm) +/- 1dB configurable with over-temperature and high VSWR protection • 20W Model : 5W to 20W (+37 to +43dBm) +/- 1dB configurable with over-temperature and high VSWR protection
Modulation	Configurable narrow band digitally filtered binary GMSK or 4 level FSK
Tx Keyup Time	< 2mS
Timeout Timer	Configurable 0 to 255 seconds
Tx Spurious	<= -37dBm
PTT Control	Auto (Data) / RTS line (Port A or B) / System Port Override / Permanent Tx
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Sensitivity	-118dBm for 12dB SINAD
Selectivity	Better than 60dB
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Spurious Response	Better than 70dB
AFC Tracking	Digital receiver frequency tracking
Mute	Configurable digital mute
Connections	
Serial Data Port A	RS232 DB9 female DCE. 300-57,600bps asynchronous
Serial Data Port B	RS232 DB9 female DCE. 300-38,400bps asynchronous
Serial Data Port Flow Control	Configurable hardware / software / 3-wire interface
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System Port	2 x RS232 RJ45 (Front & Rear): 19,200bps, for configuration and diagnostics
Digital I/O	2 Inputs monitored by TView+ Diagnostics Software, 2 outputs user-configurable by TView+ Diagnostics Software
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Product Data Sheet Trio EB450 & EB45e
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Operating Modes	Base, remote, repeater or store n' forward
Data Buffer	16kbyte of on-board RAM
Channelshare™	Trio's unique supervisory collision avoidance system
Multistream™	Simultaneous data stream delivery allows for multiple vendor devices/protocols to be transported on the one radio network
Data Turnaround Time	<10mS
Firmware	Local flash-based firmware updates
Security	
Encryption*	128-bit AES
Password Protection	Password protected configuration sessions
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Power Supply	13.8Vdc nominal (11-16Vdc)
Transmit Current	• 5W Version: 1.3A nominal @ 1W, 2.5A nominal @ 5W • 20W Version: 2.7A nominal @ 5W, 4.7A nominal @ 20W
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Dimensions	• 5W: 19" 2 RU rack mount, 483 x 90 x 414 mm including heat-sink (19 x 3.5 x 16.3in.) • 20W: 19" 2 RU rack mount, 483 x 90 x 446 mm including heat-sink (19 x 3.5 x 17.6in.)
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Product Data Sheet Trio EB450 & EB45e
Model Code

	EB45x-aabbb-cde represents the part number matrix
Model	**Trio Radio EB450 & EB45e**
TBURE	E-Series
Code	**Select: Unit Type**
B	Base / Repeater Station
Code	**Select: Generic Frequency Band**
45	380 to 518 MHz
Code	**Select: Data Ports**
0	Two serial ports
E	One Ethernet & one serial port
Code	**Frequency (400MHz bands) – Frequencies to be specified at time of order**
47	380 to 396 MHz (Tx & Rx)
48	395 to 406 MHz (Tx & Rx)
50	403 to 417 MHz (Tx & Rx)
63	406 to 421 MHz (Tx & Rx)
64	415 to 430 MHz (Tx & Rx)
56	418 to 435 MHz (Tx & Rx)
57	428 to 444 MHz (Tx & Rx)
55	436 to 450 MHz (Tx & Rx)
51	450 to 465 MHz (Tx & Rx)
65	455 to 470 MHz (Tx & Rx)
52	465 to 480 MHz (Tx & Rx)
53	480 to 494 MHz (Tx & Rx)
60	490 to 500 MHz (Tx & Rx)
54	505 to 518 MHz (Tx & Rx)
A6	370 to 400 MHz (Tx & Rx)
B3	395 to 426 MHz (Tx & Rx)
B4	413 to 447 MHz (Tx & Rx)
B5	433 to 450 MHz (Tx & Rx)
C1	436 to 467 MHz (Tx & Rx)
C2	450 to 487 MHz (Tx & Rx)
C3	473 to 518 MHz (Tx & Rx)
Code	**Select: RF Channel Data Rate & Bandwidth (Internal Modem)**
F01	FCC (IC) 9600 / 19k2bps, 12.5kHz – provides M-Series 003 compatability
F02	FCC (IC) 19k2bps, 25kHz – Not for sale in North America
E01	ETSI 9600bps, 12.5kHz – provides M-Series 004 compatability
A01	ACMA 4800 / 9600bps, 12.5kHz – provides M-Series 001/002 compatability
A02	ACMA 9600 / 19K2bps, 25kHz
Code	**Select: Diagnostics & Encryption**
D	Diagnostics Only (No Encryption)
E	Diagnostics & Encryption*

Product Data Sheet Trio EB450 & EB45e
Dimensions

Code	Select: Options
0	Separate Tx & Rx Antenna Ports
1	Configured for internal band reject duplexer. Duplexer not included. Contact local sales office for further details.
A	20W RF Power Output**
Code	**Hot Standby Configuration**
0	Not used

Communications Standards:
FCC – Federal Communications Commission (USA)
IC – Industry Canada
ETSI – European Telecommunication Standards Institute
ACMA – Australian Communication s and Media Authority

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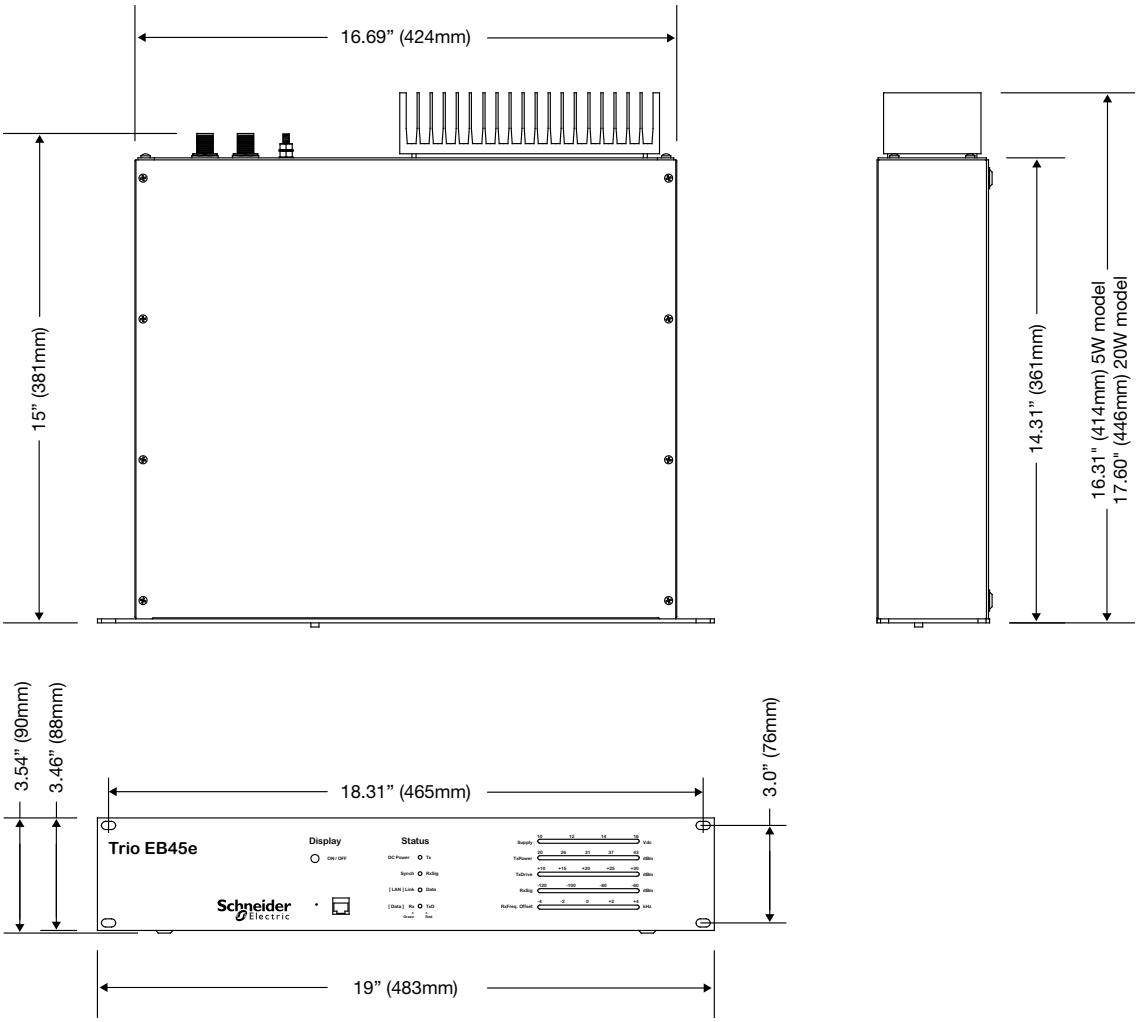
** Local regulatory conditions may prevent the use of 20W in some countries.

Note: Some radio models may not be available in your country. Local and regulatory conditions may determine the performance and suitability of the radio in different countries. It is the responsibility of the buyer to ensure the radio model meets the regulatory conditions required. Contact your local Schneider Electric sales office for more details.



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